EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

OFFICE OF FEDERAL
PROCUREMENT POLICY

June 2, 1997

MEMORANDUM FOR SELECTED SENIOR AGENCY PROCUREMENT EXECUTIVES
AND THE ACTING DEPUTY UNDER SECRETARY OF
DEFENSE (ACQUISITION REFORM)

FROM: Steven Kelman
Administrator

SUBJECT: Performance-Based Service Contracting for Research and Development

One of the most difficult areas to do performance-based service contracting (PBSC) is in contracting for research and development, because of the difficulty of being able reasonably to get a commitment to a completion-form contract. The attached article, from the June issue of Contract Management, discusses the experience at NASA Goddard Flight Center in adopting PBSC to a research and development environment.

I would be grateful if you could share this article with people in your organization who contract for research and development, both on the procurement and program sides.

Attachment

# Performance-Based Contracting in Research & Development: Nasa's Advanced Camera for Surveys

*By Susan M. Sparacino*

***From Contract Management Magazine, June, 1997***

The Hubble Space Telescope Procurement Office at the National Aeronautics and Space Administration's (NASA) Goddard Space Flight Center needed to award the contract to complete design and development of an advanced science instrument. The contractor had been selected under an announcement of opportunity (AO). The new instrument, Advanced Camera for Surveys (ACS), will be placed on-board the telescope by shuttle astronauts during Servicing Mission 3 in 1999.

Almost by definition, advanced instruments are developmental, and the procurement office had a great deal of experience with research and development (R&D) contracting, usually on a cost-reimbursement basis. Cost-plus-award-fee and cost-plus-fixed-fee contracts had been the mainstays in recent years. Although they require heavy-duty administration, these contract types had served our needs well.

Now, in response to the National Performance Review and contracting initiatives from the Office of Federal Procurement Policy (OFPP) and NASA Headquarters, we were challenged to move in new directions, to undertake performance-based contracting (PBC). As if we had somehow overlooked performance in the past!

Technical and resources representatives of the Hubble Space Telescope Project were supportive of PBC in concept but skeptical about applying PBC to developmental space flight hardware. They had heard that "Performance-based contracting means structuring all aspects of an acquisition around the purpose of the work to be performed" (OFPP Policy Letter 91-2).

They understood the need for "objective, measurable performance requirements and quality standards," to be used in developing statements of work, determining contract type, and performing contract administration. They knew we wanted to "pay for results, not just best efforts." No one here had experience with applying PBC to complex R&D requirements, though, and most PBC examples described requirements for off-the-shelf hardware or routine institutional support services.

The biggest obstacle to PBC was, and still is, the contracting culture. In a project accustomed to high-risk, high-visibility undertakings, PBC's emphasis on holding a contractor accountable and reducing oversight is viewed with misgivings. The project considers its instrument contractors part of a larger team, along with government representatives at multiple NASA centers and the Department of Defense, astronauts, and other contractors responsible for Hubble operations, the servicing mission, the shuttle, and launch facilities. Instrument contractors are required by contract to cooperate with other contractor participants. Meeting all of the requirements for a manned shuttle launch clearly is a collaborative effort, and the success of any given mission is a testament to that collaboration.

The contracting officer's technical representative (COTR) made a commitment to use a specification based totally on performance. She worked with the principal investigator (the scientist whose investigation required the space flight instrument) and the science community to establish a realistic technical specification, making trade-offs to balance science return against cost and schedule considerations.

Establishing performance levels for the purpose of measuring performance proved to be a difficult step. The principal investigator wanted performance levels to be as high as

possible, the contractor wanted achievable levels, and the government wanted good performance that was affordable. The negotiated performance levels balance these considerations. The buying team (contracting officer (CO), COTR, and resource analyst) believed that a proper mix of cost, schedule, and instrument performance incentives would motivate the contractor to make appropriate trade-offs as design and development of ACS continued under contract.

## THE PDC CONTRACT

In March 1996, we awarded a cost-plus-incentive-fee (CPIF) contract for detailed design and development of the ACS. We call this completion-form contract PBC because of these features

- Use of a performance specification, as opposed to a design or a functional specification;
- Use of structured incentives for cost, schedule, and instrument technical performance; and,
- Provisional billing arrangements that reinforce the performance incentives.

Some might argue that this is not PBC at all; that under our cost-reimbursement contract the contractor still recovers costs for an instrument that does not perform as intended. Technically this may be correct, but the CPIF contract seemed ideally suited to our R&D requirement. Use of structured incentives is a significant departure from our normal practice, introduced after selection of the contractor's proposal. In designating this a PBC contract, we recognize a transitional phase that embodies a real cultural change. As our experience and our successes build, we expect to implement PBC more fully.

Use of a performance specification is fairly straightforward. A summary of the structured incentives and the provisional billing arrangements follows.

## STRUCTURED INCENTIVES

The maximum incentive fee is divided into three separate pools: cost incentive (25 percent of the total), schedule incentive (25 percent), and instrument performance incentive (50 percent). The amount of available fee in each pool the contractor can earn depends on performance in the area being measured (i.e., cost performance incentive fee is earned based solely on cost performance, schedule performance incentive fee is earned based solely on schedule performance, and instrument performance incentive fee is earned based solely on instrument performance).

### Cost Incentive

Perhaps the strongest cost incentive is NASA management's position that it will consider cancelling any program that exceeds budget by more than 15 percent. The contractor is fully aware of the implications this may have on contract cost performance.

The contract contains Federal Acquisition Regulation (FAR) clause 52.216-10, "Incentive Fee," which applies only to the cost incentive pool. Generally this clause establishes that the contractor's fee will increase from target to maximum in recognition of

cost underruns, or drop from target to minimum in recognition of cost overruns. Our share line looks like a cliff. At the outset all parties recognized that completing the program for target cost was a formidable challenge, so we agreed that the contractor would earn the maximum cost incentive fee unless actual cost exceeds a certain point. At that point, earned fee drops to zero.

The contract does not establish a "not-to-exceed" cost, but for a major overrun, the contractor earns no cost incentive fee, and the prospect of program cancellation looms.

### Schedule Incentive

The contractor will earn 100 percent of the schedule incentive fee pool if the ACS is delivered on or ahead of schedule. Schedule incentive fee will be reduced at a rate of 1.75 percent of the total schedule incentive fee pool per day for every day delivery is delayed, with the fee reduction limited to 100 percent of the schedule incentive fee pool.

### Instrument Performance Incentive

The contract establishes three units of measurement for instrument performance, and the instrument performance incentive pool is further divided into these units:

- Wide field channel discovery efficiency;
- High-resolution channel discovery efficiency; and,
- Solar blind channel discovery efficiency.

The titles are not as important as the idea that together, they signal the technical success of ACS.

For each unit of measurement, the contract establishes a standard performance range. Performance within the standard performance range earns neither positive nor negative performance incentive. Performance that exceeds the standard range earns positive performance incentive. Exceptional performance (also defined objectively in the contract) results in the maximum positive performance incentive. On-orbit performance that falls short of the standard range will result in refund of incentive earned at on-ground verification.

## Program Reviews

Under the PBC contract, program reviews are focused more on end objectives than on design details or methodologies. Reviews have been less adversarial and thus more productive. Both parties are fully invested in the successful completion of the contract, and the result is a new sense of cooperation. Although the government and the contractor have worked well together in the past, the contract vehicle has helped to refine roles for achievement of a common purpose. The partnership is strengthened, and a new synergy has emerged.

## Powerful Incentives

For the contractor, the incentives are quite powerful. One example is the contractor's reaction to the single missed schedule milestone. Under previous cost-reimbursement contracts, a missed milestone did not set off alarms -- costs, though increased, were paid, and fees, though delayed, also were paid. Under the PBC arrangement, late completion of a milestone resulted in forfeiture of a provisional payment. Also, questions were raised about overall schedule and the prospect of delays in the final delivery. The contractor took this very seriously and, with no prodding by the government, focused its efforts on regaining lost schedule. The program teems with a new energy, as the contractor works to recover the provisional payment with completion of the next milestone. The contractor has accepted the challenge to maximize its return through the incentive fees.

Properly structured incentives the contractor to develop an instrument that optimizes cost, schedule, and performance without government micromanagement. With the PBC contract, we expect the contractor to complete the ACS on time and on schedule, delivering an instrument that meets or exceeds performance requirements, an instrument for which we are more than willing to pay the maximum incentive fees.

## Technical Failures Are Not Acceptable

For NASA, perhaps more so than for other agencies, technical failure is not an acceptable outcome. NASA programs are too costly (although even this is changing), and failures too visible to excuse poor performance by saying "Not to worry -- the contractor was not paid top dollar." In the past, concerns about the impact of failure on individual careers and even on the success of the agency may have produced a reluctance to move in the directions suggested by PBC. With increased emphasis on cost control, however, we need to try new contracting approaches aimed at increasing not only our efficiency but also our effectiveness as government/contractor teams. This is not just NASA's challenge, but the challenge for all government personnel.

## Moving Forward

NASA recently issued another AO for the next scientific investigation, planned for installation on Hubble in 2002. We expect this will result in another R&D contract for an advanced instrument. The AO encouraged offerors to propose collaborative arrangements, leveraging government funding with support from sources outside NASA. A cooperative agreement has not been ruled out, or maybe we'll try something else. With this and other success stories, our institutional resistance to new contracting approaches is eroding. We will continue to try new ideas to achieve our objectives -- that's PBC!

## ABOUT THE AUTHOR

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